(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 801 354 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
15.10.1997 Bulletin 1997/42

(51) Int Cl.[6]: **G06F 15/16**

(21) Application number: **97301969.8**

(22) Date of filing: **24.03.1997**

(84) Designated Contracting States:
DE FR GB

(30) Priority: **09.04.1996 US 630097**

(71) Applicant: **International Business Machines Corporation**
Armonk, N.Y. 10504 (US)

(72) Inventors:
- **Carpenter, Mark Alan**
  Raleigh, North Carolina 27614 (US)
- **Lection, David Bruce**
  Raleigh, North Carolina 27612 (US)
- **Molander, Mark Edward**
  Cary, North Carolina 27513 (US)

(74) Representative: **Litherland, David Peter**
IBM United Kingdom Limited
Intellectual Property Department
Hursley Park
Winchester, Hampshire SO21 2JN (GB)

(54) Location/motion sensitive computer connection

(57) A method. data processing system and program product for providing a connection from a portable data processor to a second data processor by acquiring a geographic location of the portable data processor and selecting a connection technique and/or a connection path associated with the acquired location of the portable data processor. The portable data processor then connects to the second data processor utilizing the selected connection technique and/or connection path. The connection technique and/or connection path may be selected from a plurality of connection techniques and/or connection paths which may be prioritized.

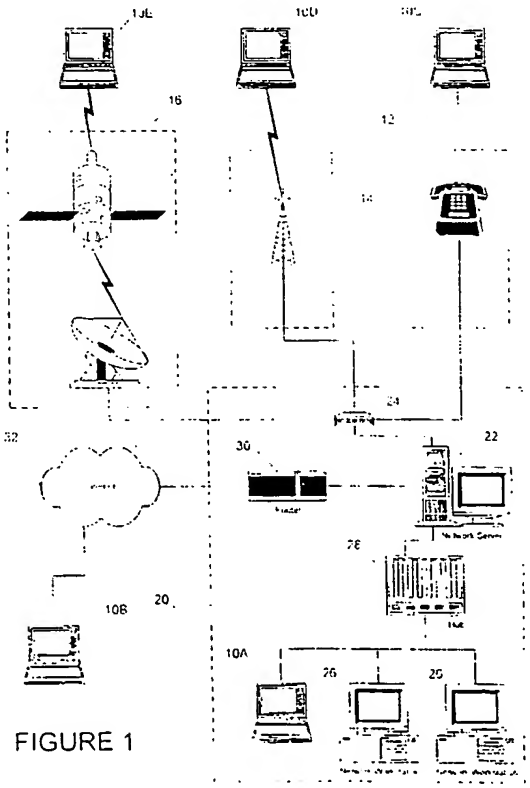


FIGURE 1

EP 0 801 354 A2

to make such a connection.

As will also be described. a connection system is provided which is suitable for making connections between a portable data processor and a second data processor from a variety of locations and with a variety of connection techniques and connection paths. The connection system will tend to increase the performance of a portable data processor connection to a second data processor by selecting an effective connection available for the portable data processor.

In further aspects of the present invention the geographic location of the portable data processor is acquired by accepting user input specifying the location of the portable data processor. Alternatively, the geographic location of the portable data processor may be acquired by acquiring the location of the portable data processor through an automated position sensing system. In a particular embodiment of the present invention the geographic location of the portable data processor is acquired through a global positioning system.

In an additional embodiment of the present invention the portable data processor determines if it is in motion. The portable data processor then selects a connection technique and/or connection path based upon the portable data processor being in motion.

In a further embodiment of the present invention a connection technique and/or connection path is associated with an acquired location based upon the historical use of a connection technique at the specific location.

In yet another embodiment of the present invention the connection technique and/or connection path is selected from a plurality of connection techniques and/or connection paths associated with the acquired location. Furthermore, this plurality of connection techniques and/or connection paths may comprise a plurality of prioritized connection techniques and/or connection paths. In such a case the portable data processor is connected to the second data processor utilizing the highest priority connection technique and/or connection path which is capable of establishing a connection. In additional embodiments of the present invention the plurality of connection techniques and/or connection paths are prioritized based upon the data throughput performance of the connection technique and/or connection path. Alternatively, the plurality of connection techniques and/or connection paths are prioritized based upon the cost of using the connection technique and/or connection path.

As will be appreciated by those of skill in this art, the above described aspects of the present invention may also be provided as apparatus, data processing system or computer readable program means.

Preferred embodiments of the invention will now be described. by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a block diagram of a system utilizing the present invention: and

Figure 2 is a flow chart of an embodiment of the present invention.

As will be appreciated by one of skill in the art. the present invention may be embodied as a method. data processing system or program product. Accordingly. the present invention may take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment combining software and hardware aspects. Furthermore. the present invention may take the form of a computer program product on a computer-readable storage medium having computer-readable program code means embodied in the medium. Any suitable computer readable medium may be utilized including hard disks, CD-ROMs, optical storage devices. or magnetic storage devices.

The present invention provides a location sensitive connection from a portable data processor to a second data processor. The present invention relates to the two primary aspects of a connection between data processors: the connection technique and the connection path. The combination of connection technique and connection path make up a connection. Accordingly, as used herein the term "connection" shall refer to the combination of a connection technique and a connection path.

As used herein the term "connection technique" refers to the communication mode utilized for communication between processors. For example. the communication could occur over a standard analog telephone line utilizing a modem associated with the communicating data processors. Thus, the communication technique would be through standard telephone lines. As will be appreciated by one of skill in the art, any number of communication techniques can be utilized for communication between two processors. Further examples of the communication techniques contemplated by the present invention include. cellular telephone. satellite telephone, direct access to the second data processor through a parallel or serial adapter. wireless interface to a wireless local-area-network or wide-area-network. and any of a number of network interface cards to a local or wide- area-network. While these examples may be utilized in carrying out the operations of the present invention, other techniques known to those skilled in the art for connecting two computers may be utilized.

As used herein the term "connection path" refers to the route that data takes to the second data processor. In the simplest form of direct connection between two data processors the connection technique could be by a serial cable and the connection path may be through communications port 1 (COM1). In another example, where the connection technique between two data processors is a telephone line and modem connection. the connection path would be the telephone number utilized to make the connection. In a more complicated example, where two data processors communicate over the Internet, the connection technique could be any one of a number of connection techniques while the connection

portable data processor 10D could connect to local-area-network 20 over a cellular link 14. Thus, the connection technique would be by cellular telephone. Finally, with respect to Figure 1, the portable data processor 10E may be in a location where neither traditional or cellular phone service is available. In such a case, the portable data processor 10E would acquire a geographic location, for example on a ship at sea, and from that geographic location select a connection technique. In the example shown in Figure 1, with respect to portable data processor 10E, the connection technique would be through satellite telephone service 16 and connect to local area network 20 through modem 24. In such a case the connection technique would be satellite telephone service.

In each of these examples for portable data processors 10C, 10D, and 10E, the connection technique has varied but the connection path may remain the same. Thus, if the connection technique involves accessing the modem 24 of the local area network 20 then the connection path would still include the telephone number of the modem 24.

As is illustrated above with respect to the portable data processors of Figure 1, the portable data processors may select a connection technique based on an acquired location, may select a connection path based on an acquired location or may select both a connection path and a connection technique based on an acquired location. Furthermore, a portable data processor may choose from a plurality of connection techniques or connection paths to select the appropriate connection for the acquired geographic location and the configuration of the portable data processor. Therefore, the portable data processors 10A, 10B, 10C, 10D, and 10E may represent a single portable data processor having available a plurality of connection techniques and a plurality of connection paths which are selected based on an acquired geographic location.

The plurality of connection techniques and the plurality of connection paths may also be prioritized such that the portable data processor selects the highest priority connection technique available and the highest priority connection path available when connecting to a second data processor. Also, the user may be prompted for input as to the priority of the connection technique or connection path if no preloaded prioritized connection information is available. The connection technique and connection path may be prioritized based upon throughput performance, cost of using the connection technique or path, or security of the connection technique or path. As will be appreciated by those of skill in the art other ways of prioritizing a plurality of connection techniques or plurality of connection paths may be employed while still benefiting from the teachings of the present invention.

The present invention is based upon the acquisition of the geographic location of a portable data processor. Many techniques are available for acquisition of the geographic location of a portable data processor. The technique selected for a particular application will depend upon the resolution required for the application and the amount of location sensing infrastructure which is justifiable for the particular application. For example, an extensive infrastructure exists which allows a portable data processor to determine its location on the face of the earth through global positioning satellite systems. However, if the location resolution required for a particular application is higher than available from a global positioning system, more refined methods of acquiring the portable data processor's location may be necessary.

One technique for acquiring the geographic location of the portable data processor is by accepting user input specifying the location of the portable data processor. For example, a user may be prompted to input the location of the portable data processor or to select the portable data processor location from a list of possible locations. This system may have cost advantages. Depending on the resolution required for the location of the portable data processor, the acquisition of the location may be automated using an automated position sensing system such as the Global Positioning System or GPS. GPS cards are readily available for laptop or notebook computers and provide locations of the computer within about 10 feet for civilian applications with even greater resolution for military applications. In the event that higher resolution of the geographic location of the portable data processor is required, specific automated position sensing systems may be implemented at a particular location. Various methods of accurately determining the position or location of a portable data processor are known to those of skill in the art. Examples of these methods include radio frequency (RF) or infrared (IR) transmitters located at specific locations and an RF or IR receiver associated with the portable data processor. In addition to acquiring the two-dimensional location of a portable data processor, the geographic location may also include the three dimensional location of the portable data processor, which would include an altitude or depth component. Thus, a user interface could be selected based upon the portable data processor being on a particular floor of a building, an altitude in the air or a depth below the sea.

To minimize the amount of user training required to operate systems utilizing the present invention, the association of connection techniques or connection paths with geographic locations as well as the prioritization of connection techniques and connection paths may be preloaded in the portable data processor by a system administrator. Alternatively, for more advanced users the association of a connection technique or connection path with a location may be created or modified by the user to further increase the usability of the user interface. In a more automated embodiment of the present invention, the connection technique or connection path associated with a geographic location may be created automatically based upon historical use of connection

in block 84. As reflected in block 86. the portable data processor then determines if a user defined retry count has been exceeded. If the retry count has not been exceeded. then the portable data processor returns to block 60 and again attempts to establish the connection.

If the retry count has been exceeded then the portable data processor invalidates the connection path in the connection path list associated with the acquired location. as shown in block 76. The portable processor then, as shown in block 74, checks to see if any valid connection paths are left in the connection path list. If there is at least one valid connection path left in the connection path list associated with the acquired location then the portable data processor returns to block 56 and again selects the highest valid connection path associated with the acquired location from the connection path list. The portable data processor then continues from block 56 as described above.

Returning to block 54, if the selected connection technique is not available. then the portable data processor invalidates the connection technique in the connection technique list associated with the acquired location, as reflected in block 72. As seen in block 70, the portable data processor then determines if any valid connection techniques remain in the connection technique list. If no valid connection techniques remain in the connection technique list. then the portable data processor ends the routine with an error. as shown in block 80, and may notify the user that a connection could not be established. Alternatively. if the connection technique is not available, then the portable data processor could prompt the user to take action to make the connection technique available. In such a case if the user made the connection technique available then the portable data processor would not invalidate the connection technique but would return to block 56 and select the highest priority path as described above. If at least one valid connection technique remains in the connection technique list, then the portable data processor returns to block 52 and selects the highest priority valid connection technique from the connection technique list associated with the acquired location and validates all connection paths in the connection path list.

Returning to block 74. if the portable data processor determines that no valid connection path remains in the connection path list associated with the acquired location, then all of the connection paths available for a connection technique have been unsuccessful and the portable data processor invalidates the connection technique as shown in block 72. The portable data processor then carries out the operations described above after invalidating a connection technique.

Returning to block 58, if the portable data processor determines that a selected connection path is not available for a connection technique, then the portable data processor invalidates that connection path in the connection path list as shown in block 76. The portable data processor then carries out the operations associated with invalidating a connection path as described above.

Returning to block 78. if the portable data processor determines that a connection attempt fails because of the connection path. then the portable data processor invalidates that connection path in the connection path list as shown in block 76. The portable data processor then carries out the operations associated with invalidating a connection path as described above.

Returning to block 82. if the portable data processor determines that a connection attempt fails because of the connection technique, then the portable data processor invalidates that connection technique in the connection technique list as shown in block 72. The portable data processor then carries out the operations associated with invalidating a connection technique as described above.

In the drawings. specification and examples. there have been disclosed typical preferred embodiments of the invention and. although specific terms are employed, these terms are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims.

Claims

1. A method of providing a connection from a portable data processor to a second data processor. the method comprising:

   acquiring a geographic location of the portable data processor:

   selecting at least one of a connection technique and a connection path associated with the acquired location of the portable data processor: and

   connecting the portable data processor to the second data processor utilizing the selected at least one of a connection technique and a connection path.

2. A method according to claim 1 further comprising the step of determining if the portable data processor is in motion: and

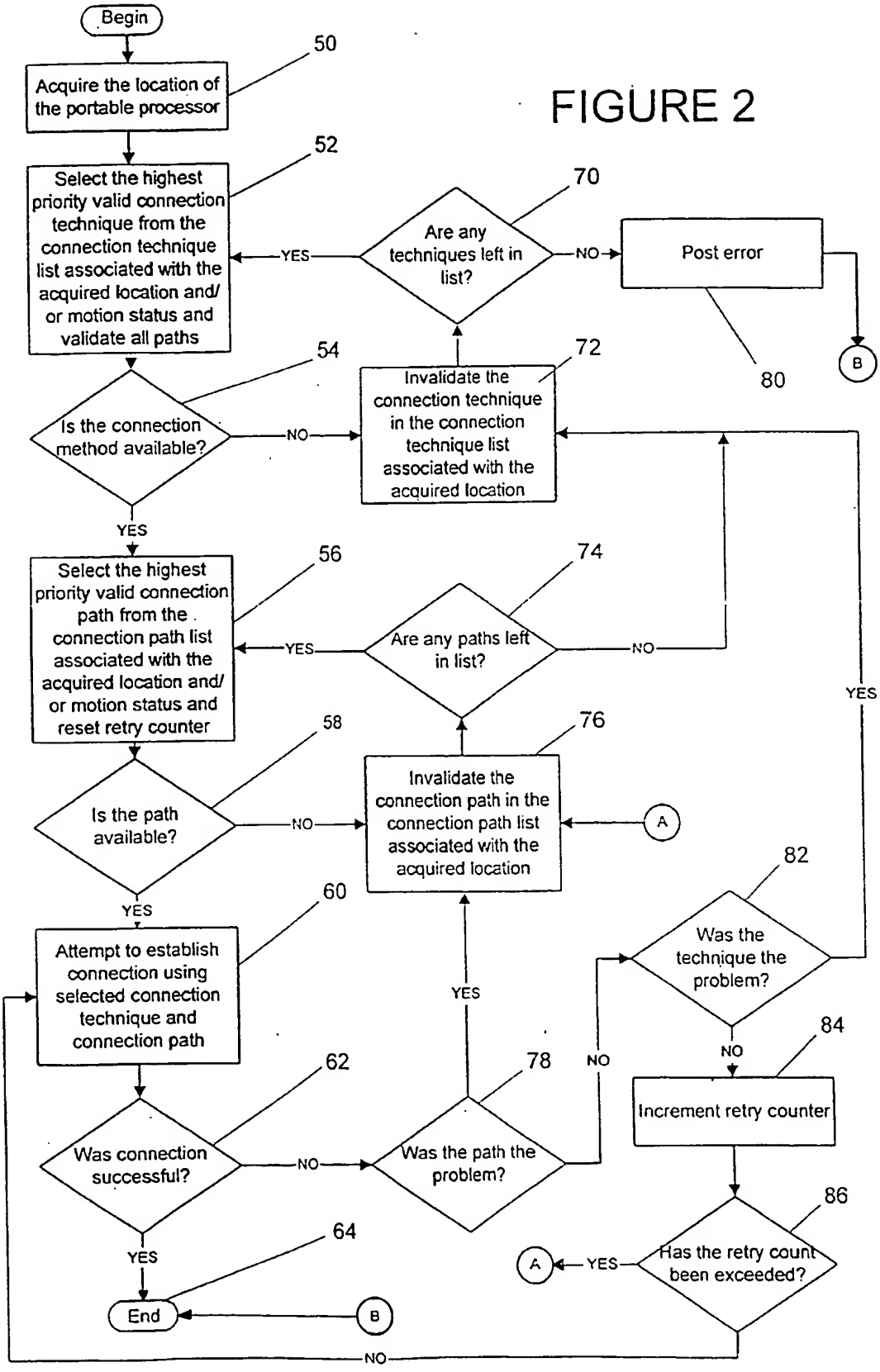
   wherein said selecting step comprises the step of selecting at least one of a connection technique and a connection path based on the portable data processor being in motion if said determining step determines that the portable data processor is in motion.

3. A method according to claim 1 wherein said acquiring step comprises the step of accepting user input specifying the location of the portable data processor.

ance.

20. A data processing system according to claim 17 wherein at least one of the plurality of connection techniques and the plurality of connection paths are prioritized based upon the cost of use.

FIGURE 2


Begin
50
Acquire the location of the portable processor
52
Select the highest priority valid connection technique from the connection technique list associated with the acquired location and/ or motion status and validate all paths
70
Are any techniques left in list?
YES
NO
Post error
80
B
54
Is the connection method available?
NO
72
Invalidate the connection technique in the connection technique list associated with the acquired location
YES
56
Select the highest priority valid connection path from the connection path list associated with the acquired location and/ or motion status and reset retry counter
74
Are any paths left in list?
YES
NO
YES
58
Is the path available?
NO
76
Invalidate the connection path in the connection path list associated with the acquired location
A
YES
82
Was the technique the problem?
60
Attempt to establish connection using selected connection technique and connection path
YES
NO
84
Increment retry counter
62
Was connection successful?
NO
78
Was the path the problem?
NO
YES
64
End
B
A
YES
86
Has the retry count been exceeded?
NO

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 801 354 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
09.09.1998 Bulletin 1998/37

(43) Date of publication A2:
15.10.1997 Bulletin 1997/42

(21) Application number: **97301969.8**

(22) Date of filing: **24.03.1997**

(51) Int Cl.[6]: **G06F 15/16**, G01S 5/14, H04L 12/12

(84) Designated Contracting States:
DE FR GB

(30) Priority: **09.04.1996 US 630097**

(71) Applicant: **International Business Machines Corporation**
Armonk, N.Y. 10504 (US)

(72) Inventors:
- **Carpenter, Mark Alan**
  Raleigh, North Carolina 27614 (US)
- **Lection, David Bruce**
  Raleigh, North Carolina 27612 (US)
- **Molander, Mark Edward**
  Cary, North Carolina 27513 (US)

(74) Representative: **Litherland, David Peter**
IBM United Kingdom Limited
Intellectual Property Department
Hursley Park
Winchester, Hampshire SO21 2JN (GB)

(54) Location/motion sensitive computer connection

(57) A method, data processing system and program product for providing a connection from a portable data processor to a second data processor by acquiring a geographic location of the portable data processor and selecting a connection technique and/or a connection path associated with the acquired location of the portable data processor. The portable data processor then connects to the second data processor utilizing the selected connection technique and/or connection path. The connection technique and/or connection path may be selected from a plurality of connection techniques and/or connection paths which may be prioritized.

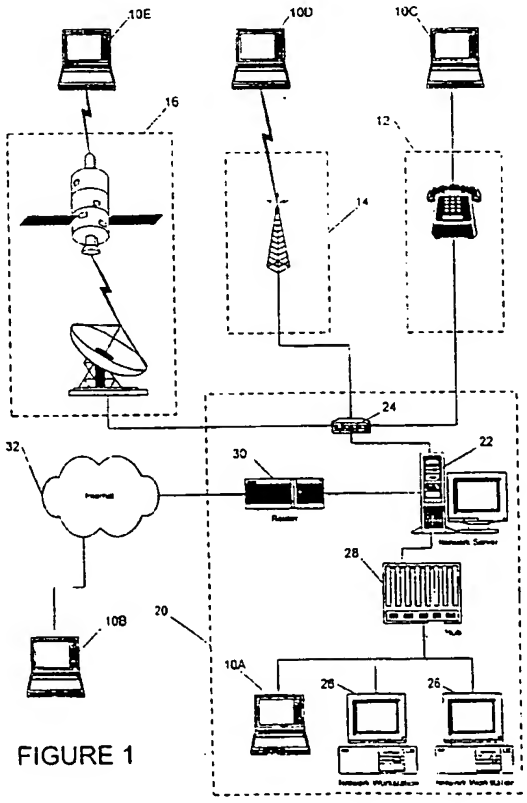


FIGURE 1

EP 0 801 354 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 30 1969

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 5 396 647 A (THOMPSON MICHAEL J ET AL) 7 March 1995 * abstract; claim 1; figures *	8,18	
A	US 5 179 374 A (WINGER DARIN G) 12 January 1993 * abstract; claims; figures *	8,18	

TECHNICAL FIELDS SEARCHED (Int Cl.6)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	21 July 1998	Durand, J

CATEGORY OF CITED DOCUMENTS

X particularly relevant if taken alone
Y particularly relevant if combined with another document of the same category
A technological background
O non-written disclosure
P intermediate document

T theory or principle underlying the invention
E earlier patent document, but published on, or after the filing date
D document cited in the application
L document cited for other reasons

& member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)